DNA analysis findings from 4,038 sexual assault kits: Using data to inform practice

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Abstract Text:
A collaborative database was created in Utah to link data on sexual assault kits (SAKs) from evidence collection through submission to the state crime laboratory and DNA analysis. Retrospective data was obtained from sexual assault examination forms completed at the time of evidence collection and crime laboratory DNA reports and coded into SPSS software package. To date, approximately 250 variables per sexual assault kit have been coded on 4,038 cases from 2010 to 2016 throughout Utah. Due to the large amount of data, multiple research studies are being conducted utilizing the database.

The purpose of this presentation was to share information on the DNA analysis findings from the 4,038 SAKs that were submitted for testing from 2010 to 2016 to inform practice for both forensic nursing/medical providers and forensic scientists. The following descriptive research findings were presented:

- STR DNA analysis findings
- YSTR DNA analysis findings
- CODIS eligible profile uploads
- Swab locations most likely to result in probative STR and YSTR DNA analysis findings
- Variables associated with affecting probative DNA analysis findings: time from assault to evidence collection, age of victim, victim bathing or showering, victim urinating or defecating; and condom use, ejaculation, number of assaultive acts, and oral contact by assailant.

In addition, generalized estimating equation logistic regression modeling findings on the predictors associated with the development of STR and YSTR findings were reported. Collaborative, multidisciplinary practice implications from the study findings were discussed. Results from this large-scale, retrospective study inform practice to help establish evidence-based guidelines for forensic nurses/medical providers and forensic scientists.

Findings:

- STR DNA analysis findings (N=1,182 SAKs):
  - Single profile, probable perpetrator: 69%
  - No comparable data: 27%
  - Mixture of more than one foreign contributor: 4%
- YSTR DNA analysis findings (N=619 SAKs):
  - Single profile, probable suspect: 64%
  - No comparable data: 28%
  - Mixture of more than one foreign contributor: 7%
- Uploaded CODIS Eligible Profiles
  - 58% when the denominator = SAKs with STR DNA testing (N = 1,182)
  - 35% when the denominator = SAKs with testing completed as of August 2018 (N = 1,952)
- Variables associated with development of CODIS eligible profile:
  - Bivariable statistics ($p < .05$)
    - Gender (female)
    - Time: assault to exam
    - Strangled
    - Multiple suspect assault
    - Vagina penis contact
    - Mouth on genitals
    - Mouth on breasts
    - Mouth on other body parts
    - Ejaculation known to occur
    - Patient with genital injuries
- Variables *NOT* associated with development of CODIS eligible DNA profile:
  - Site of evidence collection
  - Relationship between victim and perpetrator
  - Serology completed prior to DNA analysis *AND* results of serology testing
  - Patient bathed or showered
  - Time between evidence collection and SAK submission